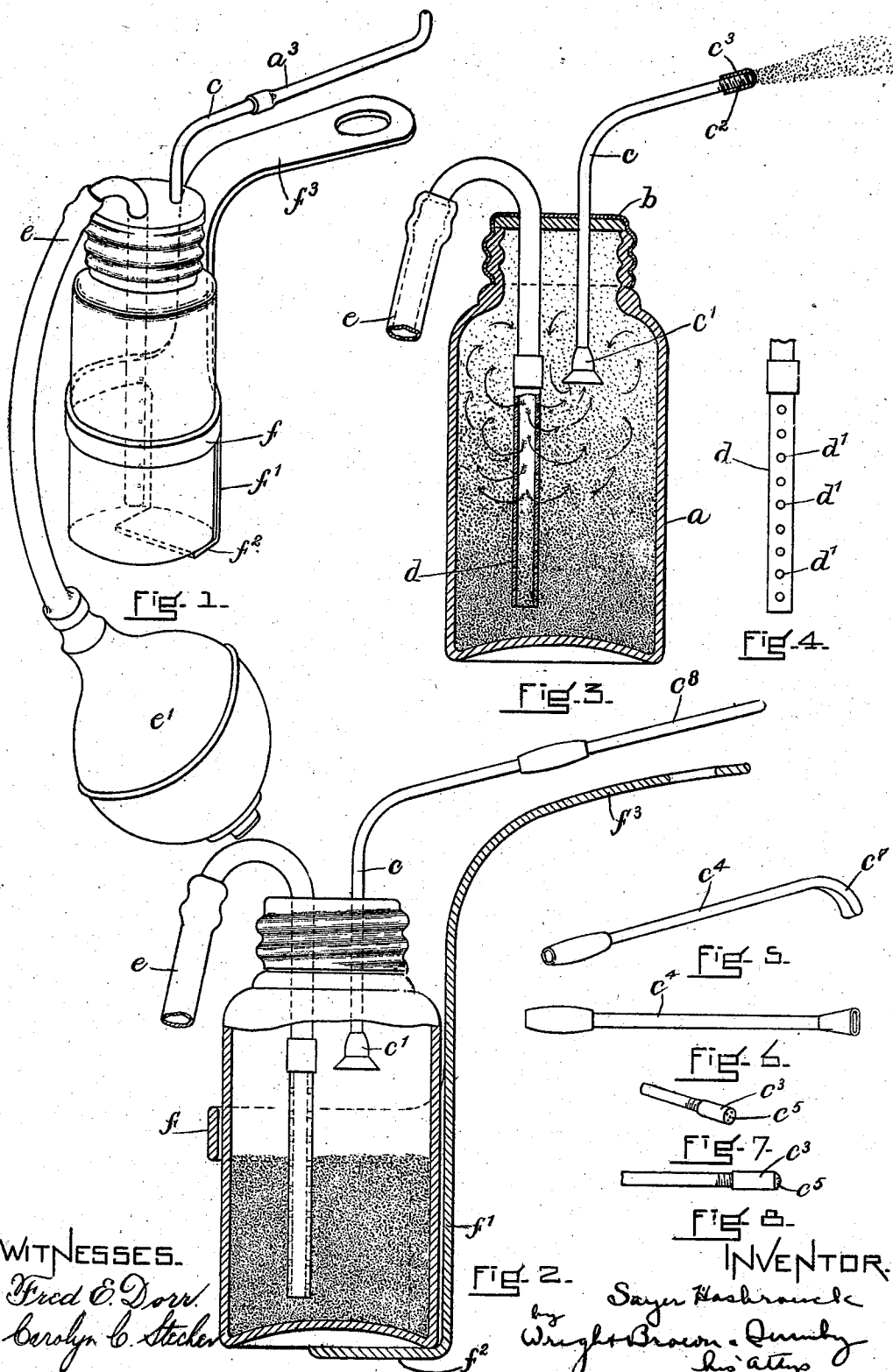


No. 881,238.

S. HASBROUCK.
INSUFFLATOR.

PATENTED MAR. 10, 1908.

APPLICATION FILED DEC. 8, 1902.



WITNESSES.

Fred E. Dorr.
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FIG. 2.

FIG. 8.

INVENTOR.

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his attys

UNITED STATES PATENT OFFICE.

SAYER HASBROUCK, OF PROVIDENCE, RHODE ISLAND.

INSUFFLATOR.

No. 881,238.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed December 8, 1902. Serial No. 134,293.

To all whom it may concern:

Be it known that I, SAYER HASBROUCK, of Providence, in the county of Providence and State of Rhode Island, have invented certain

5 new and useful Improvements in Insufflators, of which the following is a specification.

This invention has relation to insufflators or powder blowers, and has for its object to provide an appliance of the character specified, by which powder may be discharged in

10 a cloud or dust of finely comminuted particles.

The invention has further for its object to provide a tongue-depressor which may be employed in connection with the insufflator,

15 said tongue-depressor being so constructed as to receive the receptacle in which the powder is placed.

On the accompanying drawings,—Figure 1 represents in perspective view the insufflator and the tongue depressor and bottle-

20 holder in position. Fig. 2 represents a longitudinal vertical section through the same. Fig. 3 represents a section through the insufflator and shows the action of the air current upon the powder. Fig. 4 represents in detail the air-tube. Figs. 5 and 6, and 7 and 8 represents the tips and caps for the discharge or delivery tube.

25 Referring to the drawings,—*a* indicates the receptacle for the powder. In its simplest form, this receptacle may be a bottle of any suitable shape having a neck terminating in a large mouth. This mouth is closed

30 by a cap *b*. Passing through the cap there is a delivery tube *c* terminating at its lower end in a flaring portion *c'*. The upper end of the delivery tube which projects beyond the cap *b* is bent, as illustrated, and terminates in a

40 rounded end *c²*. The end of the delivery tube is externally threaded or otherwise arranged for receiving the tip *c³*, as shown in Figs. 6 and 7, or the extension tube *c⁴*, as shown in Figs. 5 and 6. The tip *c³* may be provided with a plurality of discharge apertures *c⁵*; whereas the extension-tube *c⁴* may have one or more apertures at the end and may be curved as at *c'* to be inserted behind the uvula or in the pharyngeal cavity. In

50 lieu of the curved extension tube *c⁴*, a straight extension tube *c⁵* may be employed, as shown in Fig. 2, this form of extension tube being particularly applicable when the insufflator is employed in connection with a

55 holder and tongue depressor, as will be subsequently explained.

Leading into the receptacle through the cap *b*, there is an air-tube *d*. This air-tube may be formed in two portions, as indicated, and its outer end is curved for the reception

60 of a conduit *e* leading from an air-compressor, such as a valved bulb *e'*. The air tube *d* is hollow, with its end open, and it is provided with a plurality of series of lateral discharge ports *d'* *d'*. Preferably these are arranged at regularly spaced intervals from its

65 end upward, so that when the receptacle is partially filled with powder, as shown in Fig. 2, a portion of the apertures *d'* will be covered with the powder, the tube being also partially filled with the powder owing to its open end.

The receptacle is preferably placed in a holder consisting of an endless band *f* which encircles the bottle, and a downwardly projecting strip *f'* which is bent at its end as at

70 *f²* to form a support for the receptacle.

Extending upward in parallelism with the receptacle, and then laterally at an angle thereto, is a flat strip *f³* which is of proper

75 dimensions to be inserted in the mouth for the depression of the tongue. This strip *f³* forms a continuation of the supporting strip *f'*,—it, the said support, and the said encircling band *f*, being preferably formed in one

80 integral or rigid mass, for reasons which will be apparent.

The receptacle is so placed in the holder that the delivery tube *c* projects just beyond the tongue depressor, so that the receptacle and holder may be held in one hand, the

85 tongue of the patient depressed by the depressor *f³*, and the air compressor bulb be operated by the other hand. In this way, the powder may be readily applied to the pharyngeal cavities, and at the same time, the depressor acts as a protection against the engagement of the tubes with the walls of the said cavities.

The delivery tube may be longer than the depressor or it may be shorter, if desired, this being merely a matter of mechanical

90 detail.

The operation of the insufflator is as follows:—Assuming that the receptacle be partially filled with powder, as shown in Fig. 2, and that the air tube be likewise partially

95 filled with the powder, the compression of the bulb *e'* forces the air into the air-tube. A portion of the air escapes from the lateral ports *d'* above the surface of the powder, but air also issues from those ports

100

which are immediately below the surface of the powder, thus lifting upward the top layer of the powder, which is whirled around in the space above the mass by the air issuing laterally from the ports *d'* above the mass, as shown in Fig. 3, and is delivered in a cloud or dust through the delivery tube *c*, the amount thus delivered being controlled by the amount of pressure on the air bulb. The provision of the air tube with the series of ports, some of which are above and some below the level of the powder, is an important feature of this invention.

The air which issues from the ports just below the level of the powder (*i. e.* the level of the powder as it may be at any time when the insufflator is not in use) and which issues up through the powder lifts that at the top in the form of a cloud, and the streams of air issuing through the upper ports become more effective in distributing or scattering the powder to insure uniformity of the mixture of air and powder before the cloud is lifted into the mouth *c'* of the delivery tube *c*. The powder which is in the tube and which is practically a little lower in height from the bottom of the receptacle than the level of the powder exterior to the tube, prevents air from being delivered in a large stream into the powder at the bottom of the receptacle, but as the powder is gradually discharged from the receptacle, the column of powder in the tube becomes lower and lower, so as to expose more and more of the lateral ports, and permit the lifting of the powder when it is nearly exhausted from the receptacle as easily and as effectively as when the receptacle is practically full. It will be remembered, however, that in all cases, the receptacle should never be so filled as to submerge the mouth *c'* of the delivery-tube *c*.

This apparatus may be effectively used for a variety of purposes, and will operate on powder that has been hitherto incapable of use with an insufflator.

Having thus explained the nature of the invention, and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the modes of its use, I declare that what I claim is:—

1. An apparatus of the character specified, comprising a closed receptacle, a delivery tube leading therefrom, an air tube extending downwardly into said receptacle from its top and having an open end relatively near the bottom of said receptacle, said air tube being provided with a continuous series of lateral ports, extending along its length, whereby the powder is raised by the air issuing from the ports just below the level of the powder and is broken into fine particles and forced out by the air issuing from the parts above said level, substantially as described.

2. An insufflator comprising a closed receptacle, a delivery tube leading from the top thereof, an air tube extending into said receptacle from the top towards the bottom thereof, said air tube having an open end and having a continuous series of lateral ports for delivering streams of air into the powder in the insufflator, and also above the level of the powder.

3. An insufflator comprising a receptacle adapted for the reception of a mass of powder, a cap for closing the same, a delivery tube extending through said cap and having its mouth located above the level of the powder, an air tube extending through said cap to a point relatively near the bottom of the receptacle, said air tube having a continuous series of lateral ports which are successively uncovered as the powder is gradually discharged from the receptacle.

4. The combination with a spraying device comprising a receptacle, a delivery tube, and an air tube, of a holder for receiving said receptacle and adapted to be grasped in the hand, said holder being provided with a portion constituting a tongue depressor.

5. A combined bottle-holder and tongue-depressor, the same comprising a portion adapted to receive, inclose and support a bottle and having a laterally extending strip to constitute the tongue depressor, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses.

SAYER HASBROUCK.

Witnesses:

EDWARD F. LOVEJOY,
SAMUEL S. STONE.